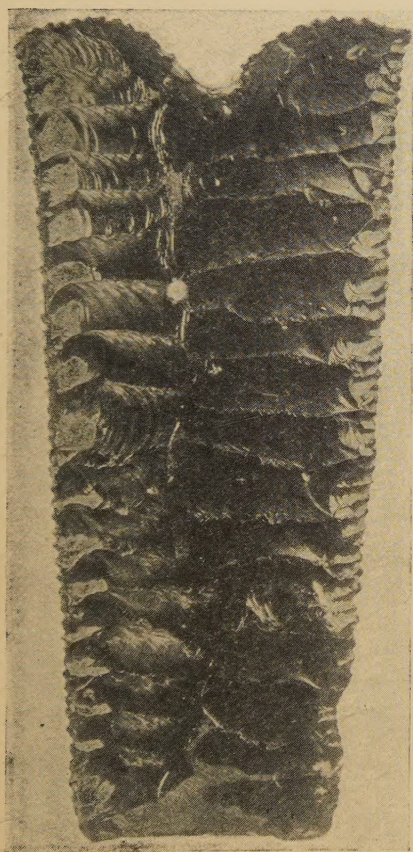


ANCIENT EGYPT

1927. SEPTEMBER. PART III.

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ANCIENT EGYPT.

WAXED TABLETS OF THE THIRD CENTURY B.C.

A CONSIDERABLE number of waxed tablets have been found in Egypt during the last half-century, besides those discovered elsewhere, as at Pompeii and Verespatak,¹ but those published below, though they contain only accounts, have a special interest, since they are, so far as I can discover, the earliest examples at present known. They were acquired, with many other objects from the Fayyum, in the season 1889-90, by Sir Flinders Petrie while living at Illahûn, and to his kindness I am indebted for permission to publish them. The various hands observable in them are all unmistakably of the 3rd century B.C., and almost certainly date from about the middle of that century, since they show a close resemblance to those seen in the well-known Zeno papyri. A further point of interest is that in several cases the wax is coloured red. I have in my transcript noted the colour of each page; it will be seen that the same tablet may have red wax on one side and black wax on the other.* I am greatly indebted to Mr. C. C. Edgar for kindly looking at a few difficult passages where I had failed to obtain a satisfactory reading.

The tablets having been bought, their provenance can be determined only by internal evidence, though the fact that they were offered for sale in the Fayyum naturally suggests that province as the place of origin. This presupposition is supported by the evidence of the text. The only geographical names mentioned are Ptolemais, Memphis, and the Delta. The two last were clearly visited on the course of a journey, since we get first (ll. 83-85), expenses at Memphis, following an entry which refers to a disbursement (ἐν τῇ φυλακῇ); then (ll. 86-91) expenses in the Delta; and then, after an interval, receipts and expenses at Memphis (ll. 100-104), and in the φυλακή (ll. 105-106), in the reverse order, followed later (ll. 119 and 128) by references to Ptolemais. In the circumstances it seems very improbable that this is the Greek city in Upper Egypt. Almost certainly we may identify it with Πτολεμαῖς Ὀρμον, which Grenfell and Hunt (*P. Tebt.*, Vol. II, p. 400; *Fay. Towns*, pp. 12-13), place at Illahûn. The references to the place seem to imply that the writer was living in the neighbourhood rather than at Ptolemais itself. The great resemblance of the hands to those of the Zeno accounts might suggest Philadelphia (the modern Gerza) as the provenance, and of the fourteen complete personal names which occur there are only three (Horion, Aunas, bathman, and Lysis) which I have not found among

¹ For waxed tablets, see e.g. W. Schubart, *Das Buch bei den Griechen und Römern*, 2nd ed., pp. 23-28, and *Einführung in die Papyruskunde*, pp. 41-42 and 46; V. Gardthausen, *Griechische Palaeographie*, 2nd ed., Vol. I, pp. 42-45, and references there; E. Maunde Thompson, *Introd. to Greek and Latin Palaeography*, pp. 14-17.

published Zeno papyri.¹ All, however, are common names (a glance at the indices of *P. Cairo Zenon* or *P. Soc. Ital.* will show how unsafe a guide to identity such names are), and it is doubtful whether Gerza was producing antiquities as early as 1889. A site nearer Illahûn is more likely; perhaps even Arsinoe.

It is a matter of considerable difficulty to determine how the "book" of tablets was made up, since all the tablets were separate when acquired. That they did all belong to one "book" is certain from the exact agreement in size and in the position of the holes for the string. Some help in determining the order is given by the state of preservation, since, though all are imperfect on one side, the amount of loss varies. The dates which occur also help, but, unfortunately, the months are not named. That the account extends over more than one month is shown by the fact that day five occurs in l. 4 and again in l. 128, day 7 in ll. 41, 134, and 144. Finally, in one or two cases the arithmetic can be used as evidence.

To take first the state of preservation. The tablet numbered 67 has on the right (red side upwards) a straight edge along the line of breakage, except for a small indentation in the lower half. On the left (complete) side, a piece of the raised margin is broken off at the top corner. The tablet is in two pieces. 68 is undamaged on the left, broken in a fairly straight line on the right, but with a larger indentation than 67; it is also in two pieces. 69 (one piece) is complete on the left, and has on the right an indentation of about the same size as 68. In 70 (one piece, complete on left) the indentation is slightly less than in 69. 71 (one piece, complete on left) is not so deeply indented as the preceding, but an additional length of tablet is lost above the indentation. A very similar shape is seen in 72 (one piece, complete on left) and 73 (do.). These facts indicate that the tablets, when combined together, were in the same order as that followed in the above description. There is room for doubt as to 69 and 70, which might be reversed, but the order adopted is confirmed by the fact that 71A must follow immediately after 70B (*see below*).

The book, however, even if made up in the above order, might have been begun at either end. That the order of writing was from 67 to 73, not *vice versa*, is shown by the following considerations. In l. 4 (67A) day 5 occurs, in l. 30 (68A) day 6, whereas l. 41 on the other side of the same tablet mentions day 7. As mentioned above, ll. 78-91 (70B) clearly record expenses on a journey to the Delta *via* Memphis, whereas ll. 99-106 (71A) refer to the return journey. The arithmetic runs on from 71A to 71B, the total in l. 112 being that of the items recorded in ll. 103-111. The same is the case (though there is an arithmetical blunder—*see* l. 127, *note*) with 71B-72A. Moreover, l. 99 (71A) mentions day 11, whereas expenses from the 12th to the 14th are recorded in l. 116 f. (71B). In l. 128 (72A), day 5, clearly of another month, is recorded.

There is, indeed, one difficulty. If 72 is arranged in such a way as to make the shape coincide with that of the adjoining tablets, the writing on both sides is the opposite way up to that of the others, and the side here numbered 72A comes second. If the tablet is arranged so as to bring the writing into conformity with that of the others, and to place the sides in the right order—72A following 71B—the shape does not coincide with that of 71 and 73. There can be no doubt,

¹ I have not counted the imperfect [...] $\rho\epsilon\iota$, probably a name, of l. 45. For the Zeno papyri, *see* *P. Soc. Ital.*, IV-VII; *P. Cairo Zenon* (2 vols. now published); Rostovtzeff, *A Large Estate in Egypt*, 1922. I must explain that the method of referring to papyri in this article is in the main that followed in the *Archiv für Papyrusforschung* and in the *Oxyrhynchus Papyri*.

therefore, that the tablets, when written, or at some subsequent time, were separate, and that when they were finally put together and left in the position where they were discovered, tablet 72 was accidentally inserted the wrong way up.

It is a noticeable fact that several hands occur. It is by no means easy to distinguish them exactly, but that two or three writers used the tablets is beyond doubt. The general character of the accounts is, however, much the same throughout, and the same names recur (*e.g.* Horion and Heraclides, or one of them, ll. 5, 31, 42, 51 and 152), Philon and Straton (or one of them, ll. 8, 43, 52, 100, 120 and 135). In all cases, too, where a verb occurs (ll. 63, 65–67, 78, 98, 100, 113 and 119) it is in the singular. In ll. 63, 65–67 (hand C) and 78 (hand D) it is in the second person, in the other cases (hand D) in the first. The identification of these hands is not certain, and it is a difficulty that the same writer should use both persons. The natural assumption would be, that where the second is used we have a clerk keeping his employer's accounts; where the first occurs the employer himself. But it is possible that in all cases the writers were clerks, and that one of these (D) was entering the accounts of a journey he had undertaken on his employer's business and with his money; or the hand of 70B is perhaps to be distinguished from that of 71.

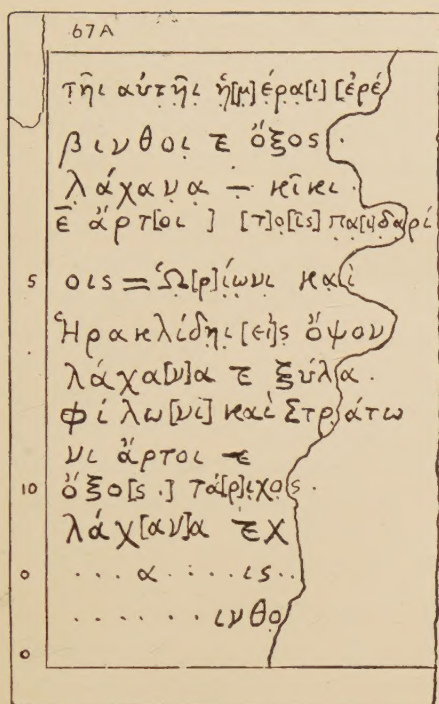
The expenses entered are largely for provisions. Several payments are made for bathing expenses, one (ll. 148–150) for the washing of clothes. Two loans are recorded (ll. 46 and 136 f.). There is a reference to an ἐπιδείπνον at Memphis in l. 83, and the bread at the house of Nicion in l. 43 f., and the wine at that of Callicrates in l. 74 f., may have been consumed at ἔρανοι (*see, however, Sir Flinders Petrie's note below*). One payment for barley for baggage animals, no doubt in connexion with a journey, is recorded in l. 122 f. Besides the journey with which ll. 78–121 are concerned, another (shorter) one seems to be the subject of ll. 122–133, and there is an entry for πορθμείον in l. 16. Several of the purchases of provisions were for slaves or "boys" (the occurrence of both παιδάρια and παῖδες in l. 115 f. shows that the words were used in different senses).

The occurrence of the words τῇ αὐτῇ ἡμέραι in l. 1 shows that tablet 67 was not originally the beginning of the "book." If, therefore, it is correctly placed at the beginning, a tablet or tablets must have been lost, a supposition supported by the non-occurrence of any general heading.

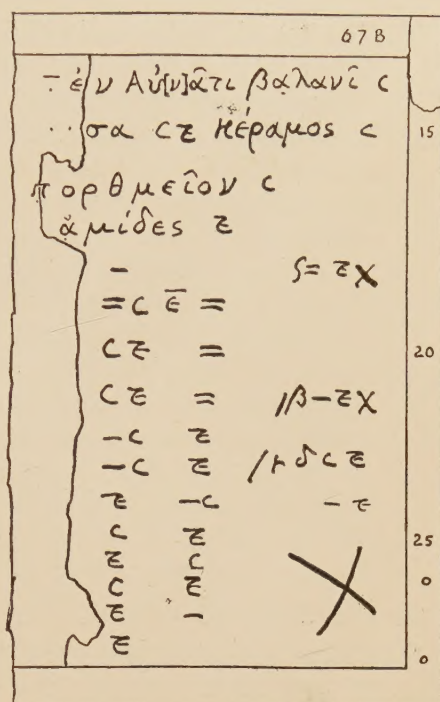
[The foregoing introduction and the notes to the text were written before I had seen Sir Flinders Petrie's ingenious reconstruction of the events concerned. I have thought it better to leave them as they stand, since they form the basis on which his hypotheses rest].

2. -ε (*see* ll. 18–29, *note*). The amount for vinegar is lost at the end of the line.
3. →. The wax is gone here, but the bottom edge of the lacuna is definite enough to suggest an intentional groove, which extends beyond the upper part of the gap on both sides, so that the l-obol sign is more likely than any other symbol.
κῖκι . : κῖκι is croton or castor-oil, used largely as an illuminant. After it is a vertical stroke, which may be accidental.
4. ε̅ : The date, 5th of the month.
5. Ὡ[ρ]ῶνι κτλ. (*cf.*, *e.g.* l. 42). The second ι is so read on the supposition that it coincides with the top of the ι of Ἡρακλίδῃ in l. 6.

6. Ἡρακλίδηι : 1. Ἡρακλείδῃ. The confusion of $\epsilon\iota$ and ι , universal later, is less common in texts of the 3rd century B.C., but quite established then ; cf. Mayser, *Gramm. der griech. Papyri*, Vol. I, pp. 87 ff. There are several examples in this account.
 8. Στρ[άτω]νι. The ρ is inferred only from the shape of the edge of the wax. For Philo and Strato, cf. l. 43 f.
 9. —ε. The horizontal stroke does not touch the curved line, hence it is possible that the true reading is —ε, i.e. $1\frac{1}{2}$ ob.
 11. —εχ = 3 chalci ($\frac{1}{4}$ ob. + 1 ch.).
 13. Neither ἐρέβινθοι nor πλίνθοι can be read. The traces suggest κρινθο.
 14. εἰν Αὐ[ν]ᾶτι : “to the account of Aunas” ; a common locution at this period. βαλανί : 1. βαλανεῖ (cf. l. 6, note).
 15. Ου. [πρά]σα (cf. l. 95) ? But not more than two letters would be expected in the lacuna.
 17. ἀμίδες. Very little of the α remains, and the word does not occur in Preisigke's *Wörterbuch*, but α is strongly suggested by the traces, and it is doubtful whether any letter preceded.
 - 18–29. These lines are quite obscure. It seems impossible to discover any consistent ratio between most of the sums set down, or between any of them and what precedes. It may help the reader to follow the arithmetic here and elsewhere if I explain the symbols used : —χ = 1 chalcus, —ε = $\frac{1}{4}$ ob., ε = $\frac{1}{2}$ ob., — = 1 ob., = = 2 ob., / = 3 ob., / — = 4 ob., / = = 5 ob., † = drachma, / = γίνεται (total). The obol contained 8 chalci, the drachma 6 obols. A figure (α , β , etc., e.g. l. 21) standing alone denotes drachmae.
- The last two figures in the amount on the right of l. 18 ($5\frac{1}{4}$ ob. 1 ch.) recall the entry $\frac{1}{4}$ ob. 1 ch. in l. 11, but this amount cannot be the sum of all that precedes, the visible amounts adding up to more than 6 ob., nor even of all the entries since the 5th day of the month (l. 4), since those visible add up to $5\frac{1}{4}$ ob. 1 ch., without including the amount (1 ob.) at the beginning of l. 18, or allowing anything for the entries lost in ll. 7, 10, 12 and 13. On the other hand, the sum in l. 21 (preceded by /, γίνεται) is the correct sum of the $5\frac{1}{4}$ ob. 1 ch. in l. 18 and the separate entries in ll. 19–21, excluding the last item (2 ob.), and it is possible that this or one of the other entries of 2 ob. may have been accidentally omitted. ε may denote the day of the month, and, if so, the first column may contain entries for a preceding day ; but those in column 2 do not correspond with those in ll. 5 ff., nor can the total in l. 23 be brought into relation with what precedes. The whole section is a mystery. At the right bottom corner is a large cross of the form ×, no doubt a mark of revision. Add χ after —ε in l. 27. Add · before — in l. 18.
30. Ἀρτε[μειδ]ῶροι. Since this was first read, a piece of wax has broken away, and the letters ρτε are now lost (a trace of ρ remains). Much of the wax on this page has gone, and a few marks which appear at places on what remains on the right side cannot certainly be identified with definite characters.
 31. Ἡρα[κλείδῃ]. ρα now lost.
 38. τοῖ[ς] π[ρ]ο[σ]α[ρ]χ[ο]ί[ς]. Very doubtful, but likely (cf. ll. 4, 41, etc.).
 39. βαλανεῖον. ν and ον now lost.



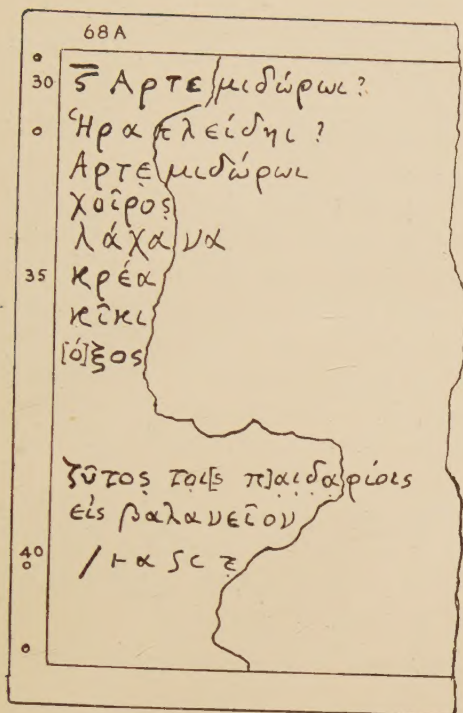
RED WAX. HAND A.



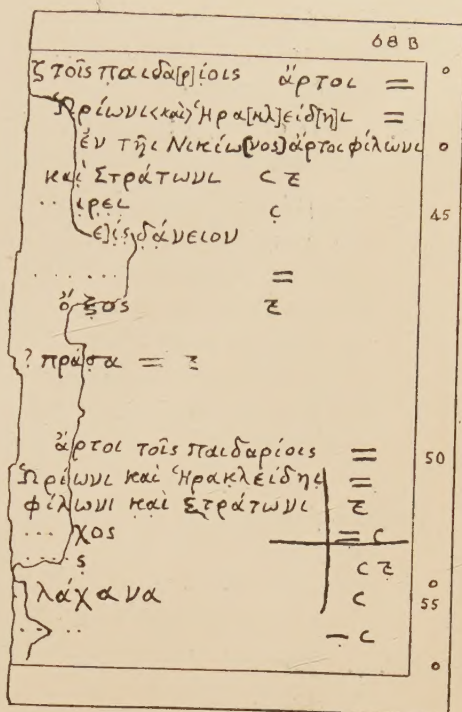
BLACK WAX. HAND B.

40. $\tau\epsilon$, inferred from the horizontal stroke, which is all that remains.
42. $\langle\kappa\alpha\iota\rangle$ (cf., e.g. l. 5).
43. $\tau\eta\iota$ Νικίω(ν)ος: sc. οἰκία. This was perhaps an ἔρανος, to which each guest contributed his share [or a restaurant; cf. Sir Flinders Petrie's note].
45. [...]ῖρει. Perhaps [N]ηρεῖ (a slave?), but in that case the η is of a different form from the others on this page.
47. The 2-obol symbol is not in a line with εἰς δάνειον, and probably l. 46 was continued in a short line, lost by the breaking away of the wax, of which more is lost here than elsewhere.
49. [$\pi\rho\acute{\alpha}$]σα (cf. l. 95). But the first visible letter may be γ .
51. Ἡρακλείδῃ. The last ι is almost obliterated by a large cross (for revision) of the form $\div$ which occupies the right bottom corner of the page.
53. Hardly [τέμα]χος, unless the line projected somewhat into the margin; but the alignment is not very regular.
55. If this line began as far to the left as the preceding we must suppose that a date preceded λάχανα.
56. $\div$ c. Very doubtful. The supposed $\div$ might be $\tau\epsilon$, but in that case what follows should be χ , which cannot be read. Below this is another apparent entry, but there is no room for anything below the first half of l. 56.
58. κυβικόν. Edgar. The meaning is uncertain; perhaps the word is to be connected with κύβιον (salted fish), which occurs in *P. Soc. Ital.*, 428, 70; 535, 37, both from the Zeno archive.
60. The reading, which is due to Mr. Edgar, is far from certain.

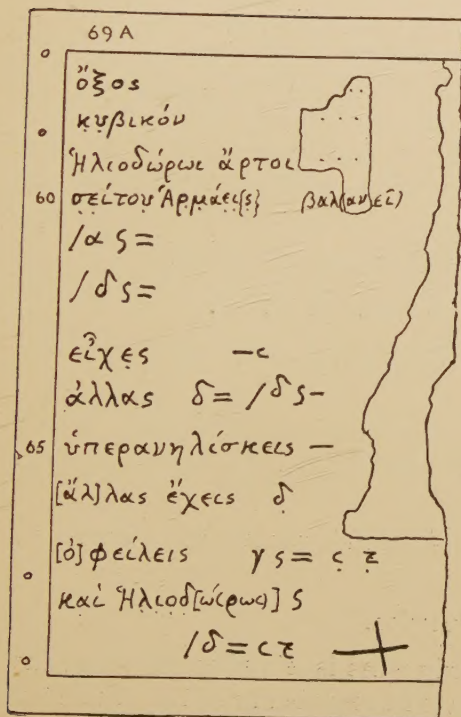
61. The loss of the figures in ll. 57–60 makes it impossible to say whether this is the total of those lines only or includes entries in the previous tablet. The relation of the total in l. 62 to this is also obscure, but its relation to what follows is clearer. Line 63 evidently means, “You received [to your credit] $1\frac{1}{2}$ ob.” In l. 64 a further receipt of 4 dr. 2 ob. is recorded, and the sum of these two receipts, which should be 4 dr. $3\frac{1}{2}$ ob., is given as 4 dr. 4 ob. Presumably a ς has been accidentally omitted after $\delta =$. Finally the credit total of 4 dr. 4 ob. is deducted from the total expenditure of 4 dr. 5 ob., leaving a debit balance (*ὑπερανηλίσκεις*) of 1 ob. Lines 66–69 are again difficult. In l. 66 is recorded a credit of 4 dr., in l. 67 a debt of 3 dr. $5\frac{3}{4}$ ob.; but in l. 65 the overdraft was only 1 ob. It almost looks as if the author of the account had deducted the 1 ob. from the sum in l. 66 (where $\varsigma - \epsilon$ can be supplied, the wax being broken away here), and then inadvertently counted the result, 3 dr. $5\frac{3}{4}$ ob., as a debit, instead of a credit, balance; but such blundering is a little difficult to accept. A further item is added in l. 68, and the new total correctly given as 4 dr. $2\frac{3}{4}$ ob. in l. 69. A cross (+) is placed at the right bottom corner. In l. 64 transcribe α .
68. *Ἡλιοςδ[ώ(ρωι)]*. Edgar. The reading is, however, very doubtful.
70. Edgar suggested *ἦς νὰὺλρον*, but what could *ἦς* refer to? There seems to be a stroke over η . If *ίς* (= *είς*) is correct it must have been a later insertion, as it is much cramped, but it is very doubtful, and after ν , $\omicron$ is a better reading than α .
72. *οφειλήματος*, but the reading must be regarded as doubtful. Not only are some individual letters, especially μ and α , far from certain, but the confusion of η and ι is not very likely at this period (see Mayser, pp. 82–85).
73. Cf. l. 43, note.
75. [*έκ*] *τοῦ Δέλτα*. Edgar.
/ $\alpha \varsigma$, the total of ll. 74 and 75, which should, however, be $\alpha - \varsigma$; hence both these items refer to the feast at the house of Callicrates.
76. The total of ll. 70, 71, 72, and 75 (the sum of 1 dr. $0\frac{1}{2}$ ob.). The wax is broken away before (*γίνεται*), but no doubt nothing preceded.
77. / $\vdash \varsigma \varsigma$, i.e. the 5 dr. $5\frac{1}{2}$ ob. of l. 76 plus the 1 ob. of l. 77. A cross (×) occupies the right bottom corner.
80. $\cap = \lambda \omicron \iota \pi \alpha \iota$, i.e. the remainder, after subtracting 2 dr. from the 4 dr. $2\frac{3}{4}$ ob. in l. 78.
82. At the end of this line is a cross (×).
83. *ἐπιδέειπνoui*. This seems more likely than *ἐπὶ δειπνoui*.
85. / = $-\epsilon$. The correct total of the sums in ll. 82, 84, and 85.
86. *Δέλτα*. Edgar.
88. = $\vdots$ more like ζ , having been made without raising the pen, but it is confirmed by the total in l. 90. *Φανη()*, e.g. *Φανήσει*, *Φανήτι*. But *Φανῆ(τι)* could also be read, and the ϕ is by no means certain.
91. This line contains (1) the sum of the totals in ll. 85 and 90; (2) the remainder after deducting this from the 2 dr. $2\frac{3}{4}$ ob. in l. 80. Very little of the $-\epsilon$ remains.



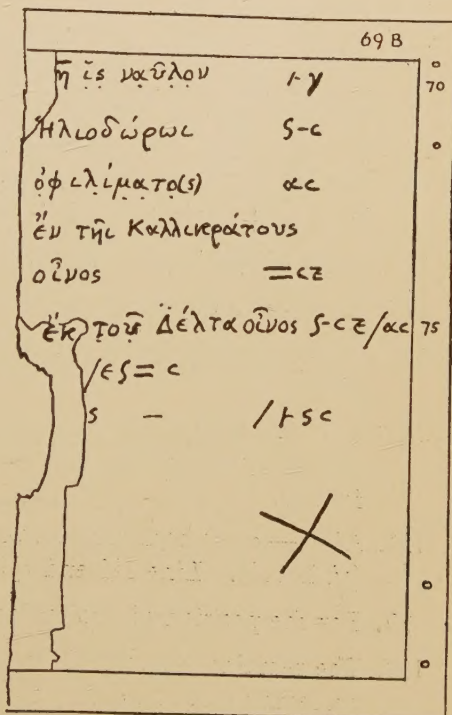
RED WAX. HAND C.



BLACK WAX. HAND C.



BLACK WAX. HAND C?



BLACK WAX. HAND C?

92. There is some wax left in the early part of this line, the breaks in which could be read as letters, *e.g.* $\beta\alpha$ is possible at the beginning. $\epsilon\pi\iota\tau\alpha\gamma\eta$ could be read at the end.
94. $\kappa\omega\nu\epsilon\iota$: or $\kappa\omega\nu\epsilon\varsigma$; probably the end of a word begun in l. 93. $\mu\acute{\eta}\kappa\omega\nu\epsilon\varsigma$ is unlikely, as the singular was generally used.
98. $\epsilon\pi\alpha\nu\eta\lambda\acute{\iota}\sigma\kappa\omega$. For this word, *cf.* *P. Cornell*, 1, 87 f., $\tau\omicron\iota\varsigma \alpha\upsilon\tau\omicron\iota\varsigma \acute{\alpha}\phi\alpha\iota\rho\omicron\upsilon\mu\acute{\epsilon}\nu\omicron\upsilon \tau\omicron\upsilon \epsilon\pi\alpha\nu\eta\lambda\omega\theta\acute{\epsilon}\nu\tau\omicron\varsigma \kappa\tau\lambda$. The context there shows that the $\epsilon\pi$ - denotes an extra payment over and above the normal issue of $6\frac{1}{8}$ cotylae. It is not clear whether in the present case it means an extra expense (for an unspecified purpose) additional to the preceding entries, or an excess in the total expenditure above some previous total. A debit balance, *i.e.* an excess of expenditure over receipts or cash in hand, is elsewhere expressed by $\acute{\upsilon}\pi\epsilon\rho\text{-}\alpha\nu\eta\lambda\acute{\iota}\sigma\kappa\omega$ (l. 65). The derivative $\epsilon\pi\alpha\nu\eta\lambda\omega\mu\alpha$ occurs in *P. Petrie*, II, 33 (a), B, 1, 3.
100. $\Sigma\tau\rho\acute{\alpha}\tau\omega[\nu\iota]$. If the genitive occurred (denoting a receipt) $\tau\omicron\upsilon$ would be required after it ("I receive from Strato of Memphis"), which does not well suit the space. Probably the dative is to be preferred, the meaning being "I have (a credit of) 1 dr. with Strato at Memphis."
104. ς . Probable from the edge of the break in the wax, and necessary for the total in l. 112.
105. $\phi\upsilon\lambda\alpha\kappa\eta\mu\iota$ was read by Edgar. Before it $\acute{\epsilon}\mu \pi\acute{\alpha}\varsigma[\eta]\iota$ could be read, but seems unlikely.
109. Without the context it is impossible to say how the abbreviation is to be expanded, or whether $\epsilon\pi\iota$ is to be separated from $\tau\rho\alpha$ (). $\tau\omicron\upsilon\varsigma$ is probably, but not certainly, the article.
111. An inserted line.
112. Clearly the total of previous items. Since these expenses were defrayed out of the 1 dr. entered in l. 101 (*see* l. 102), there was a debit balance ($\acute{\upsilon}\pi\epsilon\rho\alpha\nu\eta\lambda\acute{\iota}\sigma\kappa\omega$, l. 113) of $\varsigma\chi$, which must have occurred in l. 113 or l. 114. The figures in l. 114 suggest that a further disbursement of $2\frac{1}{2}$ ob. was added to this expenditure, but that the writer has inadvertently entered the total as $\vdash \alpha\chi$ instead of $\vdash \beta\chi$.
114. The o of $\tau\omicron\iota\varsigma$ is more like ω , but o is not well made in this hand.
117. *I.e.* 4 ob. a day for three days = 12 ob. = 2 dr. Read $\acute{\eta}\mu\acute{\epsilon}$.
118. The sum of the totals in ll. 114 and 117. A cross ($\times$) is written in the margin here.
119. = is followed by a long, slightly curved, vertical stroke, perhaps merely intended to separate this line giving the credit from the payment which follows.
121. After — c two horizontal strokes, like the 2-obol sign, perhaps for punctuation (*cf.* l. 119). Line 122 end $\tau[\acute{\omega}\iota]$.
72. For the position of this tablet, *see* Introduction.
127. The remainder, 1 dr. $1\frac{1}{2}$ ob., seems clearly what is left after deducting the preceding total, 21 dr. $0\frac{1}{2}$ ob., from the credit recorded in l. 119. The total should therefore be the result of adding the items in ll. 123–126 to the total

70 B

ἔχεις δ = ζ ε
 ναῦλον ι β
 β = ζ ε
 καὶ ἐν τῇ φυλακῇ
 ὄψον - ζ ε
 [ε μ μ] ἐμφε ἐπιδείπνῃ
 [λα] χανα ὄξος ε
 ἐπὶ δέλτα ε / = ε
 λευ. ε ὄξος ε
 = φανη δ
 [άρ]τοι - παιδαρίοις =
 [ζ] ὕτος ε / α ζ ε
 / ι β η = ζ ε

BLACK WAX. HAND D.
70A BLANK.

71 A

ταγη
 κωνεῖ τῶν παιδαρίων
 95 πράσα καὶ ἔτνος [
 εἰς βαλανεῶν [
 τοῖς παῖσι ε
 ἔπανηλίσκω =
 ἰα
 100 ἔχω παρὰ στρατῶνι
 ἐμ Μέμφι ι α
 τούτου
 λάχανα ὄξος ε
 ἔλαιον - ε
 105 ἐμ [...] φυλακῇ
 ὄψον - ε

BLACK WAX. HAND D?

71 B

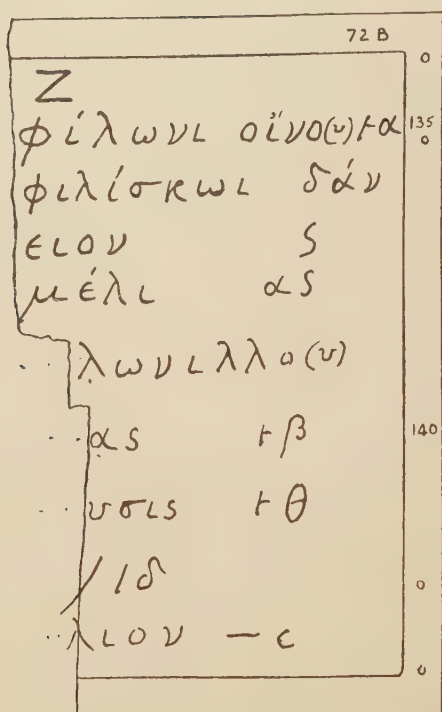
βλιων X
 νωι X
 τους ἑπιτρα() ε
 αχη S-
 εἰχος ε
 ι α ζ ε
 ὑπερ ανηλίσκω
 τοῖς = ε ι α χ
 ἄρτους τοῖς παιδαρίοις καὶ
 τοῖς παῖσιν ἀπὸ ι β
 εἰς εδ τῆς ημέρας - ι β
 / ι γ χ X
 ἐμ Πτολεμαίδι ἔχω ι κ β =
 στρατῶνι καὶ τοῖς με
 120 τ ὄχ(οις) αὐτοῦ ι κ - ε

BLACK WAX. HAND D?

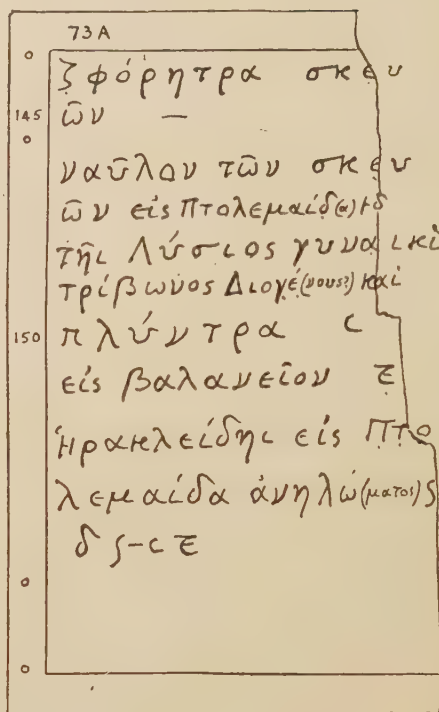
72 A

κριθὴ τοῖς ὑποζυγίοις καὶ τ
 οὐηλάτῃ τὰ δέοντα S
 ἔλαιον -
 125 ζῶταν τοῖς παιδαρίοις ε
 ὄψον ε X
 / κ ε η α - ε
 ἐ ἐμ Πτολεμαίδι
 ἄθαρα καὶ γάλα τοῖς παι
 130 δαρίοις ε
 ἄρτους -
 ζῶτος ἐν τῇ ὁδῷ ε
 / = η / = ε

BLACK WAX. HAND D?



BLACK WAX. HAND E.

RED WAX. HAND F.
BACK BLANK.

- in l. 121, but the correct result is 21 dr. $0\frac{1}{4}$ ob. Apparently the writer misread $\tau\epsilon$ in l. 125 as c. There is a large cross (X) after this line.
132. ζ . Only the outline of the left side of this character remains on the edge of the tablet, but the total in l. 133 establishes the reading.
133. $\alpha\delta = c$. The remainder, after deducting 2 ob. from the 1 dr. $1\frac{1}{2}$ ob. in l. 127.
134. ξ . Evidently the day of the month, not drachmae; the total in l. 142 does not include it.
141. $\eta\upsilon\sigma\iota\varsigma$. One thinks of $\Pi\epsilon\kappa\eta\upsilon\sigma\iota\varsigma$, but $\Pi\epsilon\kappa\eta\upsilon\sigma\epsilon\iota$ would be expected by analogy.
142. On the right side of the tablet there is a mark like α , perhaps accidental.
143. — c. The c has a short horizontal stroke about the middle, perhaps accidental, but the whole may be meant for $\tau\epsilon$, though the — is quite separate.
144. $\phi\acute{o\rho\epsilon\tau\rho\alpha$.
147. $\tau\delta$. Only a small portion of the δ remains, but the letter is guaranteed by the total in l. 154, which also shows that nothing is lost here.

H. I. BELL.

A PTOLEMAIC HOLIDAY.

THE tablets now brought into historical use by Mr. Bell's careful editing yield an unusual view of Ptolemaic society. They refer to a boat-trip during ten days from Ptolemais (now supposed to be Lahun) to the head of the Delta and back, just as the Cairenes now go for a picnic to the Barrage. There were at least thirteen people in the party: Horion (l. 5) and Herakleides (l. 6), another pair Philon and Straton (l. 8), the "lads," apparently separate from either pair (l. 50), for whom tops were bought (l. 94), and, as well as the lads, there were also "children" (l. 116). Besides these nine, there are named expenses for Artemidoros (ll. 30 and 32), Aunas (l. 14), Harmais (l. 60), and Heliodoros (ll. 59, 68, and 71), and, by the repetitions of the names and the baths required, these are doubtless of the party, making thirteen. Some responsible person doled out the tetradrachmae one by one as required, making up the account each time (ll. 62-66, 91, and 114); he may have been one of the persons named above. There are six different handwritings, probably of different members to whom the cashier dictated the expenses.

The payments are not for any business purposes, either of trade or labour. They are too trifling for the whole food of a dozen people—ravenous boys—being merely for some fresh bread and vegetables. There were many purchases before starting, evidently laying in a stock of provisions for the party (ll. 10-29).

There were two definite parties combined, as two sets of purchases were accounted separately before starting (ll. 19-29), and at the end, after rendering up the balance to Straton, there were further costs for donkeys and the lads getting home (ll. 122-126).

Having now mapped out the conditions we can begin to restore the tale of the affair. The first panel, inside of the outer cover, is lost, but it held the expenses of the beginning preliminaries. Three of the passengers, A, B, C, wrote the accounts dictated to them, till the cashier took it over at Memphis. The family of Horion lived a little way out of Ptolemais (ll. 122-126), and was asked by the Straton family, who lived at Ptolemais (ll. 119-121) to join in a trip to the fork of the Delta, sending their paidogogos to act as paymaster, while Straton would advance the cost, to be shared up at the end. On the 4th of the month this was put in hand (l. 4), and on the 5th, Horion and Herakleides (l. 5) joined the boat, and a lot of provisions were laid in to the separate order of the two families (ll. 19-29), totalling a tetradrachma and three coppers over. The paidogogos had begun with 14 tetradrachmae in hand, and paid up 5 tetradrachmae unspent at the end (l. 121), having spent on the whole trip about the equivalent of four or five pounds in modern Egypt.

Having laid in provisions, they started on the 6th, down the canal, which ran below the pyramids on the west bank. Straton and Philon—rich boys—went ashore somewhere to a restaurant of Nikion. By the 8th they reached Memphis, and the paidogogos took over the writing of the account, the elder boys being tired of it. He paid about 7s. 6d. to the boatman, who would not go farther, as Upper Nile men now always refuse to go below Cairo, for that is the Delta business. The party went to the restaurant of Kallikrates and had dinner,

using mostly their own store of food. Another boat was hired to go to the fork of the Delta, about twenty-four miles, and back, for 5s. At that festive place some tops¹ were bought for the boys—their fairing (l. 94). Returned to Memphis, Straton drew a drachma (say half a crown) to spend as he liked. The customs guards on the frontier of Middle Egypt received a little tip of 9*d.* or 1*s.* on going down (l. 81) and back again (l. 106), tips called *opson* or “a savoury,” as we speak of a “sop” to anyone. The guard of the nome collected the customs on the southern portion of the Heptanomide (*Ox. Pap.*, XII, 113), and so, doubtless, at the northern frontier near Memphis.

By the 14th the party were back again at Ptolemais, and here the paidogogos settled up the balance in hand with Straton, holding over two drachmae for winding-up expenses. After that he spent for barley and donkey-boys to take the baggage of the Horion family home, and some beer for the lads. As he kept a balance equal to about 3*s.* over till a fresh account next month, it is clear that he was not a regular steward but rather one of the household, trusted for occasional business.

We here see the outline of a merry picnic party of a dozen youths and boys of two friendly families, going down to a holiday resort in an open boat, sleeping on board, and looked after by their paidogogos who held the cash, who dictated the accounts on the out voyage to one or other of the boys, but who had to write it all by his own hand on the return voyage because they had become too careless. They started well with detailed notes as to who each payment was for, so as to divide it up exactly afterwards; but on the return they gloriously left that to chance, and had to estimate the total at so much a day (ll. 115–117). The whole affair seems just what might be expected at present for a holiday party between those places in the late summer, when the heat was over and the canals still full.

Three of these tablets are published in photograph, half-size, in *Objects of Daily Life*, Pl. LIX; but as the order of them is now known they have been renumbered—so 67 in that plate is now 71*B*, 68 is 68*A*, and 70 is 73*A*. Mr. Bell has kindly consented to my transcribing his text in the form and size of the original tablets. This renders the tablets as the writers would have written them if the modern text-hand had been then in use. The effect of the damages is thus better understood, and there is in this arrangement more of the spirit of the original than appears in formal print. Every account-keeper will relish the triumphant crosses with which each balancing is marked, when a fresh tetradrachma was taken out of store. The dots under letters show that they are uncertain. The ellipses [] are for conjectures. The loops () indicate the extension of abbreviations, < > mark words omitted by the writer. The outline is that of actual wood, of which only just the frame edge has been broken off by a pick-stroke (see ll. 4 and 8, and, at the other end, ll. 144, 146, and 152, where the rest of the word had to be passed to another line). The inner wavy line marks the limit of the wax coating where broken away, and so bounds the text from the reconstruction. Some tablets have suffered much from crystallised salt, but others are as fresh as when written.

F. PETRIE.

¹ Here Mr. Bell protests that the plural should be *oi*, and not *ei*, but no other sense is likely in the circumstances.

OBSIDIAN.

OBSIDIAN, or volcanic glass, is a form of lava, which has been completely fused, and it is found in most volcanic districts, though it is not so usual as the more earthy and pasty lavas. It varies in colour from a completely opaque black through every grade of translucency to a perfectly clear and colourless transparency, though this last is very rare. Just as flint or chert can only be derived from particular strata, and must have been carried by trade if found at any distance from these centres, so the presence of obsidian objects in a non-volcanic country is proof of trade with some centre of volcanic activity. Unhappily the scientific identification of any given piece of obsidian with specimens from any one deposit is beset with difficulties, so that it is at present impossible to say categorically that the given piece did, or did not, come from a certain locality. Yet, however, within limits, it is possible to attain a considerable degree of probability as to the place of origin, and further to eliminate other places as hitherto having produced nothing comparable to the material under discussion. This is useful as indicating the trade routes.

With these remarks in view a study of the obsidian question, as presented by Egyptian archaeology, will not be unprofitable.

SOURCES OF OBSIDIAN.

In the *Labyrinth Gerzeh and Mazghuneh*, p. 24, I published an account of a piece of obsidian found in the predynastic cemetery of Gerzah and dating to the second predynastic period. It was not possible to date it more exactly than to the period between s.d. 43-70. The Mineralogical Department of the South Kensington Museum kindly inspected the piece, but did not make a petrological study of the physical properties. They stated that, of their specimens, the Gerzah piece was more like the Samian to look at than any of the others. At the same time the opinion was expressed that such resemblance as there was between the two was not at all close, and with that I had to remain content for the time being.

Belief in the importance of the Melian obsidian trade has so engrossed archaeologists' attention as to blind them generally to other possibilities, yet time and again isolated individuals have realized that there were difficulties in the way of thinking that all the obsidian which is found on Near Eastern sites came from Melos, but the subject has never received the attention it deserves.

Thus wider views have been expressed. Bosanquet, in his detailed study of the obsidian trade (*Phylakopi*, p. 229), says: "Lipari, Sardinia, Pantelleria, Auvergne, are sources for implements found in the western Mediterranean; the deposits near Tokay in Hungary for any found north of the Balkans; the Caucasus and Russian Armenia for any found in the Black Sea and in eastern Asia Minor," and he thinks of Abyssinia as a possible source for that found in Egypt.

Peet, Wace, and Thompson realized that there were curious phenomena to be explained away if the obsidian used in Thessaly had of necessity to be derived from Melos (*Classical Review*, 1908, p. 236 and n. 2). Once more they name Tokay, the Caucasus, and Russian Armenia as possible sources.

Sudhoff, a geologist, brings plenty of evidence to show that obsidian exists in great quantities at the south-western end of the island of Cos, *i.e.* on Mount Zeni on the Kephalos Peninsula, and the little island of Hyáli (Glass Island) lying in the bay. He thinks it quite possible that this place, therefore, may have played an important rôle in the obsidian trade of the eastern Aegean and even in that of Egypt (*Die Naturwissenschaften*, Berlin, 1927, pp. 335 f.).

After examining the pieces of obsidian found at Râmes near Istânoz in south-western Pisidia, Myres pronounced them definitely to be not of Melian origin (Ormerod, *Annual Brit. School at Athens*, XVI, p. 102, n. 6).

Speaking of the obsidian vase from Byblos in Syria, Clermont-Ganneau says that obsidian "n'est nullement de provenance exclusivement méditerranéenne, et qu'on aurait tort d'en faire l'apanage caractéristique de la civilisation égéenne," and then goes on to speak of the possibility of an Ethiopian origin for it (*Syria*, III, pp. 296-7).

De Morgan, who was a geologist and had made archaeological researches in Armenia, takes it for granted that the obsidian he found elsewhere, *i.e.* in the Pusht-i-Kuh mountains and at Susa, was of Armenian origin, though he also remarks in one place that it might have come from Arabia (*Délég. en Perse*, I, p. 46). In the same way Pumpelly, who was also a geologist engaged in archaeological research, takes it for granted that his single piece at Anau in Turkestan came there from the Caucasus (*Explorations in Turkestan*, I, p. 181). Others record their obsidian implements without enquiring as to the possible source of origin.

Now, when obsidian is found to be in such common use as it is in Armenia and Mesopotamia it is hardly possible to refer so vast a trade to an island so small and so remote as Melos until all possibilities of a nearer provenance have been exhausted. As a matter of fact there is a great obsidian field close at hand in Armenia itself upon which the Near East may have drawn without the necessity of going all the way to the farther side of the Aegean. Various travellers have reported the presence of obsidian from a number of places here, for instance, at:—

Nimrud Dagħ.—Great black masses of obsidian, "pure and black as jet," are found in the crater (Lynch, *Armenia*, II, p. 302). There are also beds of a "dark green obsidian which was glittering in the sun" (*op. cit.*, p. 300). Obsidian blocks, "coal-black in hue," are lying about in the fields on the slopes (*op. cit.*, pp. 299 and 311). At Göl Bashi, at the eastern foot of this mountain, the lava is "strewn with blocks and small fragments of jet-black obsidian" (*op. cit.*, p. 319).

Sipan.—Impure obsidian is found in the crater (Lynch, *op. cit.*, p. 339, n. 1).

Kara-Kala, a peak of the Bingöl Dagħ.—Traces of obsidian are visible in the lava on the eastern side (Lynch, *op. cit.*, p. 366).

Alagöz.—(de Morgan, *Délég. en Perse*, I, pp. 45 and 46.)

Bardès.—"Numerous masses of black and brown obsidian . . . occurred in such quantities and in blocks of such a size that the road in some places was literally paved with it." "A lofty hill, which appeared to be a mass of obsidian so numerous were the fragments of that mineral which lay around its base" (Hamilton, *Researches in Asia Minor, etc.*, I, p. 191).

Erzerum and Van.—Deposits of obsidian have been reported from these places to de Morgan (*Délég. en Perse*, I, pp. 45 and 46).

In fact, Armenia is largely volcanic, and has been described as composed of "great plains divided by irregular mountain masses of eruptive volcanic origin" (Lynch, *Armenia*, II, p. 145). Similarly of Cappadocia, Chantre says: "Le pays est essentiellement volcanique" (*Miss. en Cappadoce*, p. 211). Of course, wherever volcanoes are, the volcanic product, obsidian, is likely to be found, and no doubt such names as I have been able to quote by no means exhaust all the localities whence a supply might have been obtained. Further, it is already known that the obsidians of Armenia differ considerably in their characteristics, for while Lynch reports (*op. cit.*, p. 300), that that from Nimrud is either coal-black or dark green in colour, and that from Sipan is "a dull, impure obsidian with ill-developed spherulites" (*op. cit.*, p. 339, n. 1), and so not unlike some of that from Nimrud, de Morgan (*Syria*, IV, p. 26), says of that from Alagöz, that it is always transparent, sometimes completely colourless like glass and often veined with very characteristic opaque bands of red. The smaller flake from Shamiram-alti, near Van, and now numbered 104882 in the British Museum (King, *P.S.B.A.*, XXXIV, Pl. XXIII, 2), has been struck from an obsidian totally different again from any of these. It is quite opaque and muddy-looking, being composed of streaks of opaque black and grey. The fracture is totally different also from that usually associated with obsidian, for instead of showing a smooth glassy surface with a series of waves succeeding each other down the length of the flake, this one has a surface that is covered all over with minute pits, giving a rough appearance under the magnifying glass, which may even be seen in the plate. It corresponds pretty well to de Morgan's description of obsidian from the Little Caucasus (*Délég. en Perse*, I, p. 45), or Lynch's of that from Sipan.

That obsidian not only existed, but was also worked and used in Armenia and eastern Asia Minor, has already been made abundantly clear by the few expeditions that have concerned themselves with such things. Thus Chantre reports:—

Numerous scraps and flakes of obsidian from near Elenovka (*Recherches Anthropologiques dans le Caucase*, I, p. 48, Pl. II, figs. 1, 2, 3, 4).

Several arrow-heads of obsidian from Samthavro and Mtzkhet (*op. cit.*, p. 48, Pl. I, figs. 1, 6, 7).

Two superb obsidian arrow-heads from Redkine-Lager (*op. cit.*, p. 48 and fig. 2; also Pl. I, figs. 3, 5).

De Morgan discovered—

Two obsidian nuclei in a tomb near Akthala (*Miss. Scientifique au Caucase*, I, p. 37).

Obsidian arrow-heads at Mouci-yeri (*op. cit.*, pp. 99 and 101).

Obsidian arrow-heads at Redkine-Lager (*op. cit.*, p. 100).

Many pottery vessels ornamented with an obsidian flake at the bottom at Cheithan-thagh, Mouci-yeri and Redkine-Lager (*op. cit.*, p. 150).

Finally he remarks: "Dans la plupart des sepultures, nous avons rencontré des éclats d'obsidienne . . ." (*op. cit.*, p. 136).

At Shamiram-alti, just outside Van, there have been found "many hundreds of obsidian knives and weapons, some obsidian arrow-heads, several stone axe-heads . . ." (King, *P.S.B.A.*, XXXIV, p. 200, and Pls. XXIII, 1 and 2; XXIV, 9). The description of No. 1 tallies with de Morgan's account of the obsidian of Alagöz in being absolutely transparent in parts, but the opaque streaks visible in the plate are black instead of red.

Chantre found near Fraktin "innombrables éclats d'obsidienne taillés en forme de couteaux, de grattoirs, de scies et de flèches, accompagnés de nucléus et de rejets de fabrication . . ." (*Miss. en Cappadoce*, figs. 93-96, and p. 129).

From another small station actually at Fraktin itself he collected other obsidian flakes (*op. cit.*, pp. 131 and 132).

His summing-up is very decisive, for he says: "En effet, le silex de nos stations occidentales est remplacé ici (Cappadoce), comme en Grèce, au Caucase et à l'Ararat par l'obsidienne" (*op. cit.*, p. 130). "En somme je n'ai trouvé en Cappadoce aucune trace de silex taillé des époques primitives de l'âge de la pierre comme j'en ai découvert autrefois dans la Syrie du nord," and still more to the same effect (*op. cit.*, p. 132).

THE LIMITS OF OBSIDIAN AND FLINT.

Indeed, the reader is struck by the absence of flint from the records of discoveries in eastern Asia Minor. In fact the only records of the use of flint within the area are those of several flakes and an arrow-head from Kutais and Sadji (Chantre, *Recherches Anthropologiques dans le Caucase*, I, Pl. I, figs. 2 and 4, and p. 48). With these exceptions, whenever flint is mentioned it is outside the area, so that we get all round about it a fringe of flint finds.

Thus, on the northern slopes of the Caucasus there were found:—

Several flint arrow-heads at Petrassowska, not far from Zelentchouk (Chantre, *op. cit.*, p. 48)

A flake of white flint from the *aoul* of Galiäte, district of Terek (Chantre, *op. cit.*, p. 48).

At Maikop, in the foothills of the northern slopes of the Caucasus, the arrow-heads that were found were of flint (Rostovzev, *Rev. Arch.*, XII, fig. 2, and p. 5).

On the western side flint is immediately found in competition with obsidian, and this is the more remarkable as the country is surrounded by volcanic lands whence obsidian might be obtained, and, as the finds show, actually was.

At Boz Euyuk (Gordion) obsidian does not appear, but only flint, though there is only a single specimen of that (Körte, *Mitth. K. D. Arch. Inst. Athenische Abtheilung*, 1899, p. 17, No. 5).

At Troy, even though on the Aegean shore, it is clear that among the stone implements flint is the usual material, and that obsidian takes only a minor part (Schmidt, *Trojanischer Altertümer*, pp. 300 and 301).

A small flint-knife was picked up near Istánoz in south-west Pisidia (Ormerod, *Annual Brit. School at Athens*, XVI, p. 90).

In this direction obsidian is reported as having been found at Rámes, near Istánoz, where there were a few pieces (Ormerod, *op. cit.*, p. 92).

At Tchukurkend large quantities of obsidian were found (Ormerod, *Annual Brit. School at Athens*, XIX, p. 48, and *Classical Review*, XXVI, p. 77), and they were of two of the varieties produced by Armenia, the transparent, such as comes from the more distant Alagöz, being in the minority. The opaque was in the majority, and might perhaps have come from either Sipan and Nimrud Dagħ, which produce an obsidian of this type, or from the place that produced the smaller flake used at Shamiram-alti.

However, the question of the place of origin of the obsidian used in western Asia Minor is far from simple, and is complicated by a number of possibilities, for besides Armenia there is always Melos, from which indeed, at the time of

discovery, the Tchukurkend specimens were supposed to have come. Then there is the island of Cos, which will now have to be considered, and yet again, there is the important volcanic region of Lydia, which is called the Burnt Land (Hamilton, *Researches in Asia Minor, etc.*, I, pp. 136-40 and 143; II, pp. 131-8). This is situated in the upper valley of the Hermus round about the modern Kula, and, being as it is, midway between Râmes, Tchukurkend and Troy, may well have supplied the obsidian to all of them.

On the south side of the Taurus there are :—

Sakje Geuzi, where flint implements were found, and with them obsidian ones also (Garstang, *L.A.A.A.*, I, Pl. XLIV, fig. 2).

At Birejik on the Euphrates it was not obsidian that was found but “*utensiles en roche dure taillés à grands éclats*,” and other finds of flint implements are mentioned from North Syria (Chantre, *Miss. en Cappadoce*, pp. 130 and 132).

At Carchemish, a little further down the Euphrates, both flint and obsidian implements were found (Woolley, *L.A.A.A.*, VI, p. 88).

At Kuyunjik, on the Tigris, King obtained obsidian implements from the lowest levels of the mound (King, *Hist. of Sumer and Akkad*, p. 343, n. 3).

From Cyprus it is significant that the only stone knife recorded by Myres is a flint one (*Cat. Cyprus Museum*, p. 13).

From the east side of the Armenian centre there come two splendid flint knives from the eastern shore of the Caspian Sea (Chantre, *Recherches Anthropologiques dans le Caucase*, I, p. 49).

Thus, then, it is clearly to be seen that there was a large volcanic obsidian-producing area in Armenia. Taking this as a centre, one finds that here obsidian was regularly used instead of flint, and that on getting down off this central plateau one immediately begins to find flint being used alongside of the obsidian. Indeed, the further one goes from this centre the more common does the flint and chert become, while the obsidian becomes correspondingly scarcer until finally at Anau, in Turkestan, in Palestine, and in Egypt it becomes a rarity.

At Anau, it is said, “*Mention has been frequently made of flint implements and flint flakes. Obsidian is a great rarity. It is represented in a single well-worked arrow-point in Culture III*” (Pumpelly, *Explorations in Turkestan*, I, p. 181; also p. 167 and pl. 44, fig. 5).

At Susa, de Morgan says: “*Les instruments d’obsidienne, bien qu’abondants, sont cependant moins fréquents que ceux faits de silex.*” (*Délég. en Perse*, XIII, p. 15; cf. also p. 14 and figs. 46, 47, 48, 49, 50, and 76, and I, figs. 403, 413, and 415.)

About 150 kilos away, at Tepe Mohammed Djaffar, near Moussian, in the Kebir Kuh, rocks of the most diverse nature were used for striking flakes. Among them there was obsidian, though it is not native to this region (de Morgan, *Délég. en Perse*, VIII, p. 82).

In the Pusht-i-Kuh Mountains, forming the foothills of the Iranian Plateau on the Mesopotamian side, de Morgan again says: “*. . . et enfin des obsidiennes beaucoup plus rares (que les silex)*” (*Miss. Scient. en Perse*, IV, p. 5).

In Palestine flint has become the normal thing and is common, while obsidian is exceedingly rare. None at all is recorded from the palaeolithic and neolithic settlements in Galilee, while flint is everywhere (Turville Petre, *Researches in Prehistoric Galilee*, passim).

At Jericho, Tell el Mutesellim, and Tell el Hesy the state of affairs is exactly the same (Schumacher, *Tell el Mutesellim*, Pl. XIVA *et passim*; Sellin and Watzinger, *Jericho*, pp. 112 ff.; Petrie, *Tell el Hesy*, pp. 49 and 50).

At Gerar, while there was plenty of flint (on exhibition at University College this summer) there was no obsidian.

At Gezer, while flint was the normal thing, a minimum quantity of obsidian was found. Thus, "Besides flint, a very few specimens of tools in obsidian were found—not more than one or two in each stratum, if indeed there were so many" (Macalister, *Gezer*, II, p. 127). This detailed statement is a fitting climax to the short view of Palestinian archaeology given above, and emphasizes the extreme rarity of obsidian. In fact, as regards obsidian, Gezer, in southern Palestine, is in just the same condition as Anau, in Turkestan. Seeing how rare it is in Palestine, it is only natural that in Egypt, which is still further from the Armenian centre of export, obsidian, as a tool, should be as rare as it is, and Macalister's description of the state of affairs at Gezer would apply equally well to Egypt where, as is well known, chert, a form of flint, was the regular substance in use for cutting implements, and for this purpose obsidian was of the rarest. As an article of luxury in Egypt, however, its history is different, the result, of course, of Egypt's peculiar pleasure in working hard stones.

It will probably have already been noticed that there is a gap in the foregoing list of zones round the Armenian centre. It is Mesopotamia, for here flint is either rare or does not occur at all, while the commonness of obsidian is very marked. In fact, the Land of the Two Rivers may be said to be practically an extension of Armenia as regards the use of obsidian, and is, indeed, in the strongest contrast to the countries on either side of it.

At Kuyunjik, in Assyria, obsidian was found, as has already been mentioned, and it is probably no mere coincidence that flint is not named.

In southern Babylonia, at Fāra, "Zahlreiche Messer und Sägen aus Silex und Obsidian," were found (*Mitth. D. Or. Gesells.*, No. 15, Nov., 1902, p. 9).

At Abu Shahrein, "obsidian, flint and crystal flakes, cores, and pegs," were found (Hall, *Journ. Egyptian Archaeology*, VIII, p. 243).

At Tell el 'Obeid, similarly, obsidian, flint, and crystal flakes were collected (Hall, *op. cit.*, p. 244, Pl. XXXIV).

From Muqayyar (Ur) and Warka (Erech), the show-cases of the British Museum exhibit a number of similar specimens.

The reason of this southern extension of the use of obsidian is not far to seek. In the alluvial flats of Babylonia there is neither flint nor other stone suitable for flaking, hence the early inhabitants were obliged to import. That they turned towards the head-waters of their rivers to Armenia is evident and, indeed, natural, for rivers form the easiest trade routes. That Upper Mesopotamia should have used the obsidian is only natural, as it is on the periphery of those lands which were the home of obsidian, and where it was used as the normal material.

The fact that obsidian implements were more commonly used in the Pusht-i-Kuh Mountains and Susa than their distance from Armenia would warrant on comparison with Palestine and Egypt, is due either to the proximity of this active obsidian trade in the neighbouring countries of Mesopotamia, or else to the fact that they were in direct connexion with Armenia by the

numerous parallel valleys which lead through the mountain ridges right down to them.

By the kindness of the staff I was enabled to handle the obsidian objects from Abu Shahrein and Warka, now on view at the British Museum. On examination they prove to be of two of the kinds known to exist in Armenia: the opaque coal-black, of which there is a crude lump and of which some fragments of vases are made, besides flakes; the translucent, varying from a cylinder, of almost glassy-grey transparency to flakes which are quite opaque in the middle, only becoming translucent where the material thins towards the edges. I was not able to observe the red veining spoken of by de Morgan as characteristic of the obsidian of Alagöz, any more than he was able to do in the specimens he found at Susa (*Délg. en Perse*, I, p. 45). That the obsidian used in Babylonia did actually come from Armenia is thus as nearly certain as can be, without a proper scientific investigation of the physical properties of the two. It is to be observed that the proportion of opaque obsidian to transparent in Mesopotamia is the inverse of that in Egypt, where the opaque is the most common.

THE NORTHERN CONNECTIONS OF EGYPT AND MESOPOTAMIA.

History, both cultural and political, makes it very natural that Mesopotamia certainly, and Egypt not improbably, should receive their obsidian from Armenia. Sumerian and Susian influences were felt far afield to the north and the north-east. From the neighbourhood of Urmia comes a cup decorated in a style reminiscent of early Susa (Virchow, *Zeits. für Ethnologie*, XXXII, p. 609, and Pl. IX, fig. 5), or a better drawing (Frankfort, *Studies*, II, fig. 21B, p. 178); further, at Astrabad at the south-eastern corner of the Caspian Sea, was found a treasure showing in its art strong affinities with that of Babylonia (Rostovtzeff, *Journ. Egyptian Archaeology*, VI, pp. 4 ff.). About 2800 B.C. Sargon of Agade certainly reached the Taurus and the Cilician Gates, and may have invaded Cappadocia (*Cambridge Anc. Hist.*, I, pp. 405-6), and between 2400 and 2100 B.C. colonies of Assyrians or Amorites were living at the important trading centres of Ganish and Burush (Kara Euyuk) (*Cambridge Anc. Hist.*, I, pp. 453 ff.). Similarly, the art exhibited on objects found in a copper-age burial at Maikop in the foothills of the northern slopes of the Caucasus goes back to the art of early Mesopotamia and the imported one of early protodynastic and late predynastic Egypt (Rostovzev, *Rev. Arch.*, XII, pp. 1 ff.).

Egypt was also in contact with this part of the world from very early days. Osiris, or his prototype, was probably established in Egypt before the Ist dynasty, and mythological references show that this most important god was not a native of the Nile Valley, but an importation from Syria, being specially connected with Byblos. Classical tradition is also very strong that he introduced, not only into Egypt, but into other parts of the world also, the elements of civilization; especial emphasis being laid on the cultivation of wheat, barley, and the vine and the harvesting and preparation of their fruits (*Diodorus Siculus*, Bk. I, ch. 14-18; Plutarch, *De Iside et Osiride*, ch. 13). It is important to note that, from evidence at present before him, Newberry tells me that he thinks it probable that Syria was the home of the art of cultivating the vine, though De Candolle (*Origin of Cultivated Plants*, pp. 191 ff.) would refer it to Armenia itself. Equally satisfactory is it that wheat and barley are almost certainly natives of Syria, where they are

quite commonly found growing wild together (Stapf, *Suppl.* 3, *Journ. of the Board of Agriculture* (London), XVII, pp. 75 and 81) ; in fact, just as Diodorus describes them when he says : “ . . . wheat and barley, which before grew here and there in the fields amongst other common herbs and grass.” A second variety of wild wheat has its original home in Syria or Mesopotamia, and yet a third in Asia Minor itself (Stapf, *op. cit.*, p. 81).

Material relics are not wanting in Egypt of this predynastic intercourse with the north, for at this time Egypt was importing a variety of commodities from this direction. In the first place there is coniferous wood, which must have come at least from the Lebanon, and, therefore, probably *via* Byblos. Remains of it have been found by Brunton at Hamamiyah, where it dates to an early period in the predynastic age. Egypt also imported a little obsidian, as will be seen from the lists attached, and lapis lazuli as well. The latter must have come to her *via* North Syria, by the road running round under the Taurus, whether it was originally mined near Koulpa in western Persia between Yezd and Ispahan (de Morgan, *Miss. Scient. en Perse*, III, p. 118), or in the far more distant Hindu-Kush Mountains of Badakshan in north-eastern Afghanistan (Wood, *Journey to the Source of the River Oxus*, 1872, pp. 170 ff.). Besides these she received emery, which has generally been thought of like obsidian, as a product of the Aegean Isles, but which, like the latter, may well have come from the lands of eastern Asia Minor. That it is to be found there, and indeed was, in classical times, is suggested by Theophrastus' statement, that a stone of the same composition as a whetstone, but harder and used for cutting gems, came from Armenia (Teubner, *Theophr. Eresii Opera. Fragm.*, II, cap. VII, 44). The preference that had been given to stone from Naxos for polishing and cutting marble and precious stones, until the Naxian was replaced by Armenian, leaves little doubt but that it was emery that was intended (Pliny, *N.H.*, XXXVI, 10(7)), for there are large deposits of it in this island. (See, further, Wainwright, *Balabish*, p. 38, n. 3.)

Egyptian and Egyptianizing objects have been found at Byblos dating to the middle predynastic and the protodynastic ages. These are the slate palette in the form of a bird for the predynastic (Montet, in *Mons. Piot*, XXV, p. 246, fig. 9, No. 2), and for the protodynastic the gold bead, the figure of the squatting ape, the cylinder-seal, and possibly the ivory bird (Montet, *op. cit.*, figs. 6, 10, 11, and 28, No. 1). Petrie also reports a vase of magnesian marble from Byblos, which is now in the Beyrut Museum, though not yet published. He recognized it at once as being of exactly the same material and form as certain vases of Khasekhemui, which he had found at Abydos in Egypt. From the Old and Middle Kingdoms there are naturally plenty of relics. A rare type of copper axe, known in Egypt in the Ist dynasty, is also found in Cyprus (Wainwright, *Balabish*, p. 38 and n. 7). It has long been known that people with anatomical peculiarities like those of the modern populations of Syria, Asia Minor, and the Balkans, had been pushing their way into Egypt from early times, so that they had begun to influence the physical structure of the inhabitants by the protodynastic times, and their features had actually become characteristic of the aristocracy of Egypt by the Old Kingdom. The name “Gizah” is applied to this type of skull, and its peculiarities are now commonly known as “Armenoid” (*cf.* Elliot Smith, *Arch. Survey of Nubia*, II, pp. 24 ff.).

In the latter part of the Old Kingdom, under Wenis and Teti, we hear in the Pyramid Texts of an Island of Fire in the Underworld (Sethe, *Pyramidentexte*,

Sections 265 and 397). It may well be that this originates in some memory of the blazing naphtha wells of the Caucasus, or possibly one of the many volcanoes of Armenia, which was not at that time extinct, or yet again, the "pits of fire" which Strabo reports as causing danger in Cappadocia (Strabo, *Geog.*, XII, ch. II, Sections 7 and 8). Some of these Cappadocian fires seem to have been due to marsh-gas. In fact, a surprising amount of evidence has already been brought to show that there might actually have been a connexion between Armenia and the Lake of Fire which this island becomes in the Book of the Dead (Petrie, *ANCIENT EGYPT*, 1926, pp. 41-5), and, indeed, as intercourse was as common as it has been shown to be, and if Osiris could come from Byblos, as he did, then there is nothing impossible in supposing that reports of phenomena of so striking a nature from further along in the same direction should have found a place in Egyptian religion.

Armenia did, in fact, serve as the Paradise for more than one of the Babylonian myths, which placed the Garden of the Blessed beyond the northern mountains, and, therefore, in that country (Albright, *Am. Journ. Sem. Lang.*, XXXV, pp. 161 and 192; XXXVI, pp. 280 ff.); the burning naphtha wells of the Caucasus and the natural flames on Mount Argæus in Cappadocia, attracted to themselves the worship of the Zoroastrians in ancient days (Frazer, *Adonis, Attis, Osiris*, I, pp. 191-2), and, apparently, one of the volcanoes of eastern Asia Minor, which was still active, provided the prototype of the Babylonian "Humbaba," half-god, half-devil (Smith, *L.A.A.A.*, XI, pp. 107 ff.).

The invaders of Egypt at the end of the Old Kingdom are shown by their button-seals and the cylinder-seal of Khandy, one of their kings of the VIIIth dynasty, to have come from North Syria or from even further afield, for the patterns employed belong to a Syro-Cappadocian body of design (Petrie, *History*, I (10th edn.), pp. 119 ff., and elaborated by Frankfort, *Journ. Egyptian Archaeology*, XII, pp. 89 ff.).

At the time of the XIIth dynasty the Caucasian peoples were pushing southward, for torques of a definitely Caucasian type, and dated to about this period, have been found at Byblos (*Syria*, 1925, pp. 16 ff., Pl. II and fig. 2), and that they finally got into Egypt is proved by the torque of similar date and design which comes from Kahun (Petrie, *Illahun, Kahun and Gurob*, Pl. XIII, 18, and p. 12), and the other found at Abydos (Frankfort, *Studies*, II, p. 149). The southward movement of the peoples, known to us by the Syro-Cappadocian button-seals at the end of the VIth dynasty and their Caucasian torques of the XIIth dynasty, were probably the two ends of a disturbance brought about by the intrusion into Armenia of new-comers from beyond the Caucasus, which was beginning at about the time of the first-named movement (*cf.* Forrer, *Sitzb. Preuss. Ak. Wiss.*, 1919, p. 1036). Anyhow, the chronological order of their appearance accords with their geographical situation; things belonging to the nearer Syro-Cappadocian area appearing earlier than those from the more distant Caucasus.

It becomes increasingly clear that there were strong North Syrian and Anatolian elements among the Hyksos invaders of Egypt in the Intermediate Period between the XIIth and the XVIIIth dynasties (Frankfort, *Studies*, II, pp. 167-9).

In the time of the great conquering Pharaohs of the XVIIIth dynasty it is, of course, well known that Egypt entered on a period of close connections with the far North which lasted on until the XXth dynasty.

This rapid survey of the continuous connection that there was between Egypt and eastern Asia Minor and the fact that Armenia is not only rich in obsidian but also used it largely, and without much doubt exported it, all make it quite unnecessary to look to the out-of-the-way island of Melos for the place of origin of the obsidian that is found on Egyptian sites. In fact, Bosanquet remarks on it, that Melos did not seem to trade its obsidian to the East, for, with the exception of Troy, he was unable to hear of any having been found on the Asia Minor coast, and, after all, this is only in keeping with the well-known absence of Minoan relics from these shores.

To cap the whole argument there now comes the result of the interesting comparative table of the physical qualities of specimens of obsidian from various sites, which is published as an appendix to Frankfort's *Studies* (pp. 190-2). It is here shown that of all the obsidians, that from Melos is the most unlike the specimen from Egypt, which latter, in fact, stands apart from all those of the western Mediterranean, Greece, and the Aegean. The greater part of the obsidian from Egypt, especially that used for luxury purposes, is of a beautiful, smooth, even texture, of a coal-black colour, quite opaque, and on the fracture looking exceedingly like pitch. Therefore, Lynch's description of one of the obsidians from Nimrud Dagh in Armenia, which he says is "pure and black as jet," "coal-black in hue," and again, "jet-black," would seem to suit remarkably well that quality generally employed in Egypt. His description of the other variety from Nimrud Dagh as "dark-green obsidian, which was glittering in the sun," would probably suit most of those Egyptian flakes which are not struck from the first-named material. Specimens of obsidian from the crater of Nimrud Dagh have been deposited by Oswald, Lynch's companion, in the South Kensington Museum of Natural History, where they are numbered B.M. 1917, 631, 16. They are of the two kinds described above, firstly, the quite opaque sort, such as was used in Egypt for objects of luxury; and secondly, a variety which becomes translucent as the flake thins towards the edge, exactly as do the flakes from Egypt. When held up to the light this latter is seen to be of a yellowish-greenish tinge. As soon as he sees these specimens anyone who is conversant with the Egyptian material will recognize the close similarity, not to say identity, of the two.

In view of what has been said in this article, it is much to be hoped that some Egyptian specimens may be sacrificed in spite of their rarity in order that a series of comparative studies may be made between them and examples from Armenia. Seeing that the appearance and the above-quoted superficial description of the obsidians from Nimrud Dagh correspond so strikingly with the well-known qualities imported by Egypt, and seeing that Nimrud is also the nearest to Egypt of the Armenian sources, it seems likely that researches carried out on examples from this mountain would turn out to be profitable.

As one of the characteristics of the Alagöz obsidian is its transparency it might be that some of the objects from Egypt and Mesopotamia, which are described as being made of "smoky quartz," would prove to be made of the clear obsidian from this mountain of Inner Armenia; de Morgan states that he has presented a complete series of specimens from Alagöz to the St. Germain Museum (*Syria*, IV, p. 26, n. 4).

DATE & PROV: OBSIDIAN

REFERENCE.

PREHISTORIC

SD. 34.	NAQADAH 1260	FLAKE
43.	DIOSPOLIS U 207	FLAKE
56 alt	"	FISH-TAIL KNIFE
57 alt	DIOSPOLIS	DISC BEADS
60 alt	NAQADAH 743	PIERCED FLAKE
44-60	QAU 1629	FLAKE
43-70	GERZAH	FLAKE
PREHISTORIC		LARGE FLAKE
"	NAQADAH 499	CHIPPED DISC BEADS
PRE? OK?	HIERAKONPOLIS	1 OR 2 FLAKES

PROTODYNASTIC

MENES	NAQADAH	VASES
"	ABYDOS	COMB
ZER	"	VASE
MERPABA	"	"
"	"	2 SCRAPS of a VASE
PROTODYNASTIC	HIERAKONP.	DISC BEADS
"	ABYDOS	A PIECE
"	NUBIA	FLAKES

OLD KINGDOM

VI. DYN.	HIERAKONPOLIS	EYES of STATUES, PEPY & SON
VI. DYN.?	"	EYES of COLD HAWK'S HEAD
O.K.?	"	EYE of VERY LARGE BIRD STATUE

MIDDLE KINGDOM

PRE XII DYN.	THEBES	EYES COFFIN of AMAMU
EARLY XII	LISHT	EYES from COFFINS
SENUSSERT II / AMENEMHET III	LAHUN	{ 1 KOHL POT 3 TOILET JARS 1 MIRROR HANDLE
SENUSSERT III.	DAHSHUR	5 TOILET JARS
SENUSSERT		PIECE of LARGE RING
AMENEMHET III	BYBLOS	TOILET JAR
" III		HEAD
AMENEMHET IV	THEBES	BALL BEADS
XII DYN.		HEAD of STATUETTE
"		SCARABS
LATE MIDDLE KINGDOM	DAHSHUR	EYES from HOR'S MUMMY CASE
		SCARABS NEFER-ANKH-RE
		VASE MER-NEFER-RE
		SCARABS
		"
		" INSCRIBED SHESHONQ

PETRIE. PREHISTORIC EGYPT. p 43
" DIOSP. PARVA. X. 33.

BERLIN MUSEUM no 15772.
PETRIE. DIOSP. PARVA pl IV.
" PREHIST. EGYPT. p 43. pl XLV. 46.
TO BE PUBLISHED SHORTLY
PETRIE & OTHERS. LAB. GERZAH & MAZ. p 24.
UNIV. COLL. COLLECTION.
PETRIE. PREHIST. EGYPT p 44.
QUIBELL. HIERAKONPOLIS II. p 12.

625-627.
de MORGAN. RECH. ORIG. EGYPT. 1897. figs
PETRIE. ROYAL TOMBS II. pl XXXII. 10.
" " II. pl XLVIII. 087.
" " II. pl XLVIII. X 106.
UNIV. COLL. COLLN. W 38.
QUIBELL. HIERAKONPOLIS II. p 52.
FRANKFORT. STUDIES II. pp 191. 192.
ASWAN MUSEUM

QUIBELL. HIERAKONP. II. p 46. pls LII. LVI.
" " II. pp 33. 45.
U.C. COLLN MARKED HIERAKONP 242

BRIT. MUSEUM no 6654.
MACE & WINLOCK. SENEPTISI pp 30. 40.
BRUNTON. LAHUN I. pls IX. XI. p 36.

nos. 60-61. 62
de MORGAN. DAHCHOUR 1894. p XXX. p 71.
PETRIE. SCARABS & CYLINDERS. pl XIII. 33.
NAVILLE. SYRIA III. pp 291 ff.
RICKETTS. J.E.A. IV. pl XIV.
CARNARVON & CARTER. FIVE YEARS'
EXPLORNS at THEBES. pl LI. 2. pp 7. 55.
BULL. METROP. MUS. SUPPL. 1911. fig 17.
PETRIE. SCARABS & CYLS. pl XV. BA-BG. XVI.
LACAU. SARCS. ANT. NE. no 28100. pl XIX. p 77.
PETRIE. SCARABS & CYLS pl XVIII. 1. 2.
PIER COLLECTION.
PETRIE. ANC. EGYPT. 1926. pp 12. 13. Nos. 1. 4.
NEWBERRY. TIMMINS COLLN. p 15. no 49.
HALL. B.M. CAT. SCARABS. p 241. no 2405.

OBSIDIAN OBJECTS FROM EGYPT.

The finest obsidian implement from Egypt is the forked lance-head decorated with the beautiful ripple-flaking which is reproduced full-size in the accompanying figure, by kind permission of the Berlin authorities. It is probably the only one of its kind, and was bought in 1902 for the Berlin Museum, where it is now numbered 15772. It has certain peculiarities beyond the material of which it is made, and these are that the serrations of the edges are very much larger than usual, and also that, being a forked lance-head it is decorated with the ripple-flaking which is proper to the long knives with the blunt noses and slightly upturned tips. None

of the other lance-heads of this type that I have seen have this, though an approximation is attempted on one or two examples of the later varieties of the shape (*Naqada and Ballas*, Pl. LXXIII, 65; Currelly, *Stone Implements*, No. 64864). As a rule they are covered with quite irregular and comparatively rough flakings. However, this collocation of forked shape and ripple-flaking is valuable, for it enables the piece to be dated with considerable accuracy, because the implements of this shape are rather earlier than the knives which regularly bear this decoration. Of the forked lance-heads published the shape of the Berlin specimen is most like the later development, which began at s.d. 47, and so far as is at present known did not last after s.d. 52 (Petrie, *Diospolis Parva*, Pl. IV). Similarly, the ripple-flaking had a very short vogue, for at present it is not known before s.d. 57 or after s.d. 63 (Petrie, *Prehistoric Egypt*, p. 49). Seeing that the



implement under discussion has the shape which dies out about s.d. 52, but the decoration which arises about s.d. 57, we shall not be far wrong in dating it to s.d. 55. Suitably enough this date is right in the middle of the period of Asiatic infiltration, which Petrie takes to begin about s.d. 50 and to become intense by s.d. 60 (*Prehistoric Egypt*, p. 49).

The predynastic disc-beads of about s.d. 57 from Diospolis Parva may be those now in the Fitzwilliam Museum.

Dr. Scharff kindly informs me that a piece of the neck of one of the obsidian vases from the Royal Tombs at Abydos is now in Berlin, where it is numbered 15456, and Newberry says there is at the Liverpool Institute of Archaeology a fine piece of an obsidian vase from the Neithotep tomb at Naqadah.

The use of obsidian as an inlay representing the pupil and iris of the human eye began with the Pepi statues of the VIth dynasty, contemporaneous with which is probably the golden hawk's head, where obsidian is also used for the eyes. It did not become common, however, until the XIIth dynasty, though even there it took a long time to replace the old-fashioned crystal. Of the five pairs of eyes from the Dahshur coffins, now exhibited in the Cairo Museum, four are of crystal, while only one is of a black stone, which Mr. Lucas tells me is probably obsidian. The instance of King Hor (from Dahshur) is curious, for the eyes of his big wooden statue and also those of a small statuette are of crystal, though those from his coffin are of the new-fashioned obsidian (Lacau, *Sarcs. ants. au N.E.*, No. 28100, p. 77, Pl. XIX; and de Morgan, *Dahchour*, I, p. 95, No. 7, for the statuette).

In the scarcity of obsidian the Old Kingdom stands in strong contrast with the preceding and succeeding ages which used so much of it ; for here we are only able to record three specimens, and each of these is used for the one purpose of representing eyes. The rarity of it at this period is emphasized by the contents of the tomb of Hetep-Heres at Gizah, where it is not mentioned at all ; a very different state of affairs from the number of vases made of it, which were found in the royal tombs of the Ist dynasty and in those of the XIIth dynasty, where the stone figures very largely indeed. It is not possible to suppose that the Egyptians at this time were cut off from the source of supply, for the Old Kingdom is well represented among the objects found at Byblos. Presumably, therefore, the fashion had changed.

From Lahun comes a mirror-handle of obsidian, but the Egyptians never seem to have used the stone for their mirrors as Pliny says the Romans did (*N.H.*, XXXVI, 67), though he also says that, being very dark, it reflected the shadow rather than the image. It is, no doubt, this use that gave it its name of "opsian" stone.

The scarab now bearing the name of Sheshonq is included among those of the Middle Kingdom, where its form places it beyond a doubt. The name must have been added in the XXIInd dynasty to an old scarab that had been found.

Newberry possesses a drawing, which he made, of a small bag-shaped obsidian vase about $1\frac{1}{2}$ inches high, and bearing the name of , a king of the Second Intermediate Period.¹ When he made his notes on the subject the vase was in the possession of Mr. Chatfield Pier, of Chicago, but it is not published in the catalogue of his collection.

Pliny states that a statue of obsidian was found in the collection of a Roman prefect of Egypt, and was returned by the Emperor Tiberius to the people of Heliopolis from whom it had been taken (*N.H.*, XXXVI, 67). If it were a large statue it was no doubt like the XVIIIth-dynasty one, from which came the face and other parts now numbered 42101 in the Cairo Museum. If, on the other hand, it was only a statuette, then it could be matched by the Middle Kingdom ones, of which the heads are still in existence to-day : that of Amenemhet III, and the other now in the Metropolitan Museum. In the same place Pliny also says that Augustus consecrated in the temple of Concord four statues of elephants, which were made of "obsian stone," though he does not indicate the size.

The Berlin block of obsidian, No. 21192, is exceedingly interesting, for the sculptor has just begun work on it with a view to making a pair of seated figures presumably of Akhenaton and his queen. It was found in the German excavations at Tell el-Amarna, and is about 8 inches in height.

The eyes of the statue of Queen Tiya are not included here, for Borchardt only describes them as being made "aus schwarzem harten Material" (*Porträtkopf der Königin Teje*, p. 10), and Scharff confirms it for me that it is impossible to say more without an analysis, which is, of course, out of the question. It is, however, most improbable that they should not be made of obsidian.

In the later examples of eyes the possibility that the substance of which they are made might be black glass should be taken into account, though in no case quoted does the material look like it, or show any of the patination so often seen on ancient glass.

¹ [This is the well-known king Ay, the 28th of the XIIIth dynasty, who has left a gateway at Karnak and many scarabs.—ED.]

DATE & PROV:	OBSIDIAN	REFERENCE
<u>NEW KINGDOM</u>		
ANTEF VII. THEBES	EYES of MUMMIFORM COFFIN	B.M. 6652. GUIDE FIRST & SEC. EG. RMS 35.
XXVII DYN. "	KOHL POT	PETRIE. GURNEH. pl. XXV. p 8.
"	SCARAB	NEWBERRY. TIMMINS COLLN p 90. no 19.
THOTHMES IV. GUROB	"	LOAT. GUROB. pl. IV. 9. p 7.
AKHENATON AMARNA	BEGINNING of STATUETTE	BERLIN MUSEUM no 21192.
TUT-ANKH-AMUN THEBES	EYES of MUMMIFORM COFFIN	CARTER. TOMB of T-A-A II. pls LXVI. LXVII. p 247.
"	EYES of MASK	" " LXXIII. p 254.
"	EYES of VULTURE	" " LXXVIA. p 257.
MID XXVIII. DYN. THEBES	FACE & PARTS LIFE-SIZE STATUE	LEGRAIN. STATS & STATUETTES I. no 42101. pl. LXIV. pp 58. 59.
"	HEAD of STATUETTE	" " no 42102 p 59. pl. LXIII.
RAMESSES III? NEW KINGDOM	SCARAB	PETRIE. SCARABS & CYLS. pl. XLII. no 123.
"	TOILET JAR	CARN. & CARTER. FIVE YEARS' EXPLOR. AT THEBES. p 78. no 33.
"	PART of a WIG	UNIV. COLL: COLLN
"	FGMT LARGE PECTORAL SCARAB	" " " 138.
ETHIOPIAN PERIOD } NAPATA }	SMALL LUMPS	GRIFFITH. L.A.A.A. IX. pl. 119. X. pp 120. 123.
XXVI DYN.	PECTORAL SCARAB	BRIT. MUS. no 15501.
EARLY PTOL. TUNAH	EYES PETOSIRIS MUMMIF. COFFIN	CAIRO MUSEUM.
II nd CENT. A.D. AKHMIM	EYES of COFFIN	B.M. 29584. GUIDE p 80. pl. XXIII.
III rd CENT. A.D. " ?	" of HEADPIECES	B.M. 21807. 54058. GUIDE pp 82. 83.

UNDATED OBJECTS

SERABIT FLAKE	UNIV. COLL: COLLN
KOPTOS "	"
T. EL AMARNA	"
NUMBER of FRAGMENTS	"
2 LARGE LUMPS	"
BEARD of STATUE	" 138.
QUFT GAMING PIECE	PETRIE. OBJECTS DAILY USE. pl. XLVIII. 137.
AMULETS:—	PETRIE AMULETS:—
HEART	p 10
SMA	pl. I. 17 A. B. C. E.
NEFER	pl. III. 31. A. p 15
DAD	p 115
PESH-KAF	pl. IV. 38. D. E. F. p 16.
PLUMES	pl. IV. 39. A. B. p 16.
PAIR of FEATHERS	p 17.
CROWNED SUN	p 17.
WRITING TABLET	p 21.
CIRDLE of ISIS	p 23.
SCARAB	pl. XI. 92 A. p 25.
UZAT EYE	p 34.
TWO FINGERS	p 51. pl. XLIII. 273. C. D.

Of the two large natural lumps of obsidian at University College, one is about the size of a man's head, and it must have been a piece like this that was utilized for the head of the statue, No. 42101 of the Cairo Museum, and for the solid statues of the Emperor Augustus which Pliny says he himself had seen (*N.H.*, XXXVI, 67).

The gaming-piece is a beautiful little object, conical in shape, which was bought from a *fellah* at Quft along with its companion in crystal. It thus has no date, and but doubtful provenance.

The flake from Serabit, in Sinai, is quite unusual in being of an opaque greenish-grey colour. Those from Hierakonpolis are described as being of a greenish-black.

It should be observed how very regularly the amulet of the two fingers is made of obsidian, being in this point in striking contrast with the other amulets which vary greatly in their substances.

Obsidian does not seem to have been used in jewellery in Egypt, though Pliny says (XXXVI, 67) that it was so in Rome. The Romans seemed to have been attracted by black stones, as they were fond of the onyx, which is black and banded with white.

There is a stone which is not uncommonly mentioned and which is called , *ds*. The word is determined with a knife and a stone, hence is likely to be the name of a material of which stone knives were, or might be, made, and indeed, the name of this material actually supplied one of the words for "knife." Black *ds* and white *ds* are mentioned together (Loret, *Rec. de Trav.*, IV, p. 21, section 50 ; V, p. 94, col. 142), and Newberry makes the very probable suggestion that the two words mean "obsidian" and "crystal," respectively. It is, indeed, exceedingly likely that they should, for these two materials do, in fact, often go together, as, for instance, in the Archaic Period, when crystal vases occur in considerable numbers along with the obsidian ones named in the lists (Petrie, *Royal Tombs*, Vol. I, Pls. IV, 1, 7 ; V, 8, 9 ; VI, 5, 6 ; VII, 4, 6, 7, 12 ; XXXVIII, 2 ; Vol. II, Pls. XLVI and XLVII ; de Morgan, *Le Tombeau Royal de Négadah*, figs. 608-24) ; the pair of gaming-pieces, of which one is of black obsidian and the other of clear crystal. Obsidian and rock crystal were both used at Napata, and once, at least, definitely in connexion with each other (Griffith, *L.A.A.A.*, IX, p. 119 ; X, pp. 120 and 138). *Ds* is generally translated "flint," but in view of the mention of the two colours of *ds* side by side, "obsidian" and "crystal" would seem to be preferable, especially as crystal flakes were found by Brunton at Badari. A *wꜣs* sceptre, which was made of *ds* is mentioned in the Book of the Dead (Budge, *Book of the Dead*, 1898 ; *Text*, p. 263, ch. CXXV, l. 25), and crystal is quite a likely substance for such an object to be made of ; for if it were a small amulet many of these are often cut out of a piece of stone, such, for instance, as carnelian, while, if, on the other hand, it were of the full size, it might quite well have been built up of rods of crystal in the same way as the well-known sard stick of Archaic date is treated (Petrie, *Royal Tombs*, II, Pl. IX, 1, pp. 13 and 27).

THE ABYSSINIAN AND EAST AFRICAN OBSIDIAN FIELDS.

There is yet one more obsidian field from which Egypt might be thought to have imported the stone, and this is Abyssinia. Obsidian is found in many places in this country. Thus, Mr. Jannasch writes from Adis Abeba : "The formation throughout is a very young volcanic one. Four kilometres in a south-easterly direction from my domicile lies a mountain complex covered with pumice-stone and logs of obsidian." In the Cairo Geological Museum there is a specimen of obsidian from the Aluto Mountain near Adamitullu, Abyssinia ; it is numbered 13398. Schweinfurth brought back specimens of obsidian from Halfen, in Abyssinia, two of which are now in this museum, where they are numbered 5535. Obsidian was found by Salt (*Voyage to Abyssinia*, pp. 190-4) in the Bay of Hawakil, near Ras Hanfilah on the coast of Abyssinia, which no doubt is, as he recognized, the deposit to which the author of the Periplus of the Erythraean Sea refers in the Ist century A.D., when he says (section 5) : "And about eight hundred stadia beyond (Adulis) there is another very deep bay with a great mound of sand piled up right at the entrance, at the bottom of which the opsian stone

is found, and this is the only place where it is produced." The obsidian on the shore is found in small lumps of 2, 3, or 4 inches diameter, but the natives said that a few miles further into the interior pieces were found of much larger dimensions (p. 192). Writing at about the same time as the author of the *Periplus*, Pliny also speaks of obsidian as being found in Ethiopia, and no doubt refers to this same deposit at Hawakil Bay near Ras Hanfilah. He calls it "obsian stone," and says: "... obsian glass, a substance very similar to the stone which Obsius discovered in Ethiopia. This stone is of a very dark colour, and sometimes transparent . . ." (*N.H.*, XXXVI, 67). He reports that it was also found in India, Samnium in Italy, and on the western coasts of Spain.

There is, however, no evidence at present and, indeed, little likelihood, that Egypt was accustomed to import her supplies from the Abyssinian coast. That fact that Egypt and Abyssinia are both on the same continent of Africa should not lead us astray into thinking that intercourse between them was easy. In the first place Hawakil Bay is more than half as far again from Cairo as is Nimrud Dagh in Armenia. To the greater distance there must also be added the difficulties of the voyage along the coasts of the Red Sea, which are well known. It is not likely that the obsidian from Inner Abyssinia should have come to Egypt down the Nile, for nothing is heard of such tribute at the time of Egypt's greatest extension southwards in the XVIIIth dynasty, and, in the great days for obsidian in Egypt, the XIIth dynasty, Egypt's southern frontier was no further away than the Second Cataract. Moreover, before the Ptolemies opened up trade with these countries, such intercourse as there was between Egypt and the southern Red Sea was very occasional and intermittent. The expeditions of Sahure and Isesi in the Vth dynasty; Pepy II's unsuccessful one, in which the leader was killed, and his other successful one in the VIth dynasty; Amenemhet II's in the XIIth dynasty; and Hatshepsut's in the XVIIIth dynasty, and the "Marvels of Punt," which were brought to Thothmes III soon afterwards, were not examples of what was commonly going on, but brilliant exceptions, worthy of being recorded in inscriptions. This lack of communication between Egypt and Abyssinia stands in marked contrast with the closeness, the continuousness and the permanence of the contact between Egypt and the Far North, which actually resulted in the affecting of the physical characteristics of the race and in the providing of the country with one of its chief gods, with kings, and with its main crops. All of this, added to the comparative nearness of Asia Minor to Egypt, and the noticeable similarity of the obsidian found in the crater of Nimrud to that commonly used in Egypt, only increases the probability that Armenia will be found to have been the country that provided Egypt with her obsidian rather than Abyssinia.

In closing, it may be mentioned that all through Kenya Colony, and especially near Kikuyu, quantities of obsidian implements have been discovered, and there are considerable deposits of obsidian near Lake Naivasha (Dewey and Hobley, *Man*, 1925, No. 51); but this, of course, is quite out of the question as a source for the obsidian used in Egypt.

G. A. WAINWRIGHT.

REVIEWS.

Journal of the Society of Oriental Research. April, 1927.

MERCER, S. A. B.—*Babylonian and Egyptian Triads*. The great Babylonian triad is Anu god of heaven, Enlil of earth, and Ea of water. They were all male deities, whose wives Antu, Ninlil, and Ninki had many children. Another triad was Sin the moon god, Shamash the sun, and Ishtar the star; in that triad one was female. Other triads of male gods were Ea, Marduk, and Nusku; Ea, Marduk, and Gibil; Sin, Shamash, and Adad.

Egyptian triads were Nut goddess of heaven, Geb god of earth, and Nu of water. Such was only a theologic speculation, as a triad they scarcely appear. Other triads were Amon-Ra, Mut, and Khonsu; Ptah, Sekhmet, and Imhetep; Sebek, Hathor, and Khonsu; and the popular one of Osiris, Isis, and Horus.

Other groups of gods existed as the Ennead in Egypt, sevenfold gods in Babylonia, Twin gods. The father, mother, and son group is exceptional, and such had no influence whatever on the Christian doctrine of Trinity. Dr. Mercer does not add what is a result of his paper, that the familiarity with the idea of Trinity has unconsciously led scholars in many directions to see triple groups of deities.

Bericht über die photographischen Expedition von Kairo bis Wadi Halfa . . .
Von WALTER WRESZINSKI. 8vo. 105 pp. 77 pls. 1927. (Max Niemeyer, Halle a. S.). 40 marks.

The great publication of the atlas of photographs of important monuments by the author was largely compiled during his expedition in 1925-6 for the purpose. Here he gives the account of his observations on the monuments, copies of inscriptions, and plates of smaller detail and of general views. It forms, in fact, the best illustrated text-book of the monuments off the beaten track, the only publication of many of them. It is an outline of the work which the Egyptian Government ought to have done a generation ago on a larger scale. The many views of Tehneh, of Speos Artemidos, Hermopolis, El Kab, and other sites would be hard to find elsewhere. The volume makes a notable addition to the works of reference.

Note on R. O. Faulkner's Review of an Egyptian Grammar by S. A. B. Mercer.

As the Editor of the Oriental Research Series in which Dr. Mercer's Egyptian Grammar was published, I may be allowed to criticize the review contributed by R. O. Faulkner in *ANCIENT EGYPT*, June, 1927, pp. 60-1.

First, it should be noted that Dr. Mercer's book would have appeared several months before Gardiner's, had it not been for printer's delays. Passing by trivial criticism, it should be observed that on the subject of the double *n* on p. 12, we find that Erman-Grapow, in the new *Wörterbuch* of 1926, continues to give only "*bḥn·t*" (without the *nw* sign), with the meaning "tower," "pylon." There are two different words, "*bḥnw·t*," which mean "pylon," "tower," and "*bḥnnw*" (with both the *n* and *nw* and without a *t*), which means "house" (cf. Budge's Edition of the *Tale of Two Brothers*, 19, 6; 27, 5; Mercer's *Chrestomathy*, p. 133, sec. IX, l. 1, where it is explained as a "house" (*pr*)). As for "*ṛnnw*" and "*pnnw*," they might have been pronounced as if there were only

one *n* or two. But who knows? In a book for beginners it is sounder pedagogy to transliterate the text as it actually was written by the Egyptians themselves. I am inclined to think that the double writing of the consonants is not accidental.

As for the "*špr*" it is much to be regretted that Mr. Faulkner apparently limits his investigations of Egyptian lexicography to the abbreviated lexicon at the end of Gardiner's Grammar. Had he looked up Erman's *Handwörterbuch*, p. 158, he would have found the meaning "Kommen zu" given first. He may also refer to Battle of Kadesh, l. 14. As for the spelling of the Egyptian word for bolt, we refer him to stela of Piankhi, l. 104, where it occurs just as Mercer has it.

In his criticism of p. 27, secs. 62-4, the confusion is apparently in the reviewer's mind only. As for me, I am unable to comprehend why the "pronominal object of the verb" is a clearer use of the English language than "accusative" used by Mercer.

As for the "pseudo-participle," Mr. Faulkner might as well have seen on p. 38, n. 14, that Dr. Mercer did *not* forget that with transitive verbs such as *šdm* the old Perfective is always passive in sense except in one case. This Mr. Faulkner chooses to ignore. Note, however, that Erman keeps the active meaning of the pseudo-participle.

I may say that I studied Egyptian with Dr. Mercer eleven years ago; he has had other pupils since. This Grammar was evolved under the constant test of experience. Unless Mr. Faulkner points out the other "various errors" that he mentions, we feel justified in saying that one can only regretfully record the verdict that this review is not a safe guide to the student nor a help to the teacher.

J. A. MAYNARD.

[Further details on these questions would be best considered by private correspondence.—ED.]

Glozel Again.

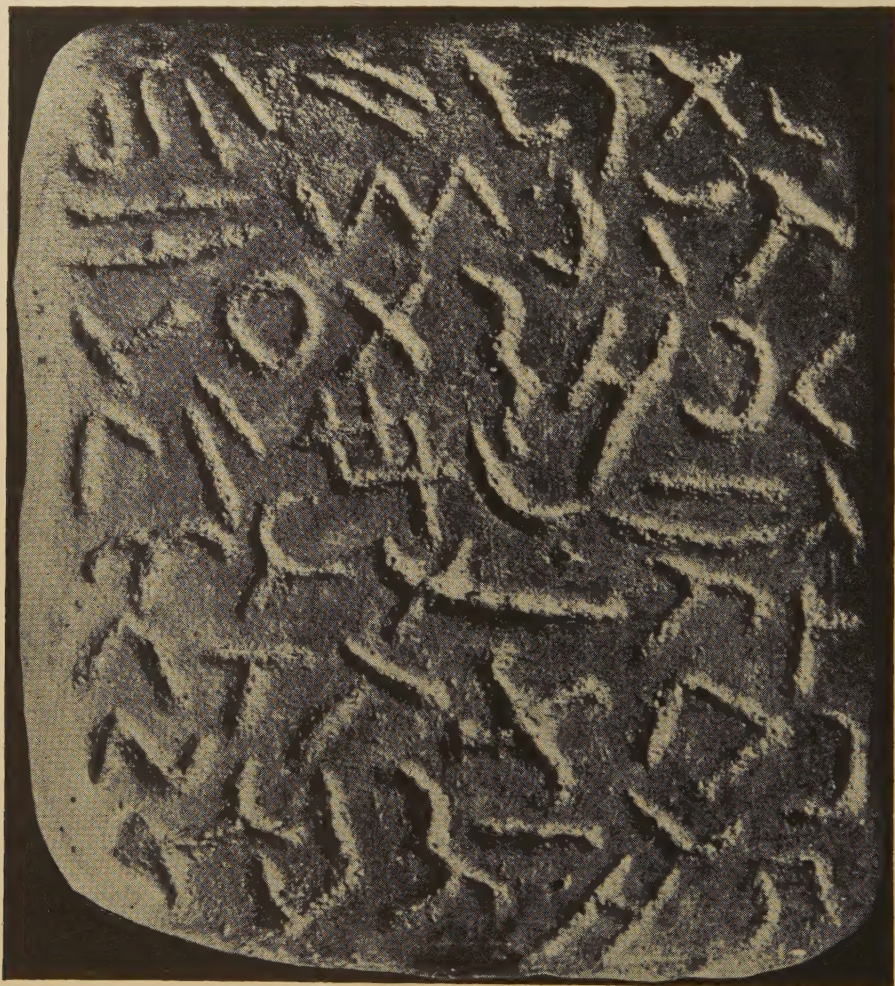
THERE has been a fervent period of assertion and counter-assertion in France lately about the objects unearthed at Glozel, near Vichy. So much has appeared in the daily press that it is needless to recapitulate the details of the supposed discovery. But after many visitors had been there with varying result, a civil engineer, M. Vayson de Pradenne, a friend of Dr. Morlet who had published the supposed antiquities, has now looked at the site critically. Where he found objects under unbroken earth there was a soft layer sideways to the front of the block, so that objects might be pushed into their designed stratum. The wrought bone he declares to be either recent boiled bone or else old surface-weathered bone, none of it mineralized. Now that there seems no question about the forging of antiquities here, it cannot prejudice the case to state the result of an analysis of the supposed writing. One of the many tablets is shown on p. 96 to give reality to the subject. If these tablets were in any real language it must be expected that, as they all come from one place, there would be some words many times repeated. If so, there should be frequent collocations of some pairs of signs. Accordingly a cross-table was prepared, with a column and a row for each of the eighty or ninety signs. Then the total number of pairs was counted, and the number of pairs that were alike, and of triplet repetitions. These coinciding pairs were not more than should be found by mere chance in the total. Therefore, there were no words repeated, and, if so, no definite purpose in the tablets. They show the mis-spent ingenuity of an uneducated mind.

NOTES AND NEWS.

THE British School party will be of five workers, Messrs. Starkey, Harding, and Floyer, with Lieut. Risdon and Miss Tufnell. They will be engaged in the coming season on the excavation of a great site of the Bronze Age, some miles south of Gerar. It is intended there to continue the same systematic search in the strata, of an earlier age than was cleared last winter, and so extend the detailed history of objects. Some shorter work will be undertaken first, before the rainy season.

The publication of Gerar with 72 plates is now in the printer's hands, and it is hoped to supply it to subscribers before Christmas. Two other volumes on Qau and Badari are also being printed, and will soon be issued. The length of important articles in this number delays many reviews, which will appear with the quadrennial index in the next number.

The Fayum, so long neglected, is a favourite region of research now. Prof. Breasted with Mr. Sandford, also Miss Caton-Thompson, beside Mr. Brunton, are all going to different sites on the desert. May they each help to explain the early anthropology.



CLAY TABLET FROM GLOZEL (see p. 95).

ERRATA IN LAST NUMBER.

Page 57, line 7 up.—For "grit" read "frit."

Page 61, line 7.—For "b nw" read "b_hnw."

Line 26.—For "s m" read "sdm."